

ABSTRACT

A gear pump includes a housing with a drive shaft projecting out through an opening in the housing to rotate a plurality of gears. A shaft seal is fixed to the housing, and includes a cylindrical, one piece (unitary) body with an internal annular core having a central circular passage with one or more reverse internal helical or spiral grooves. The central passage closely receives the drive shaft and the groove(s) provide a pumping function as the drive shaft rotates to prevent fluid leakage along the shaft. The body of the shaft seal includes a plurality of discrete, radially extending recesses opening along an exterior annular side surface of the shaft seal and arranged in circumferentially-spaced relation to one another. An annular cooling chamber entirely and continuously circumferentially surrounds the internal core and is fluidly connected with the radial recesses to provide passive conductive cooling for the shaft seal.